NOTES ON FISHES FROM WESTERN AUSTRALIA, AND DESCRIPTION OF A NEW SPECIES.

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(Plate xxxvii.)

By an arrangement with Mr. B. B. Woodward, Curator of the Perth Museum, we have received a small collection of fishes obtained, for the most part, in the Swan River, near Perth.

No attempt has been made to catalogue the fishes of the western coast of Australia, and indeed, with the exception of isolated records, little has been done since the early voyagers collected there. We have Castelnau's "contribution,"* and the following species received by us are recorded by this writer from the neighbourhood of Freemantle.

DOROSOMA EREBI, *Günther.*

HEMIRHAMPHUS INTERMEDIUS, *Cantor.*

As *H. melanochir*, Cuvier and Valenciennes.

SPHYRÆNA NOVÆ-HOLLANDIÆ, *Günther.*

In addition to this species and *S. obtusata*, it is possible that we may have a third species in New South Wales, for the description of *S. novæ-hollandiæ*, by Ogilby,† does not tally with that form. In typical examples the ventral is inserted wholly in advance of the first dorsal, while that writer describes the fin as being inserted beneath the anterior half of the first dorsal; he, however, figures it (Pl. xxx.) more in agreement with our examples.

THERAPON ELLIPTICUS, *Richardson.*

Mr. Woodward informs us that the specimens forwarded were taken at Kimberley, in fresh water.

THERAPON CAUDAVITTATUS, *Richardson.*

SPAROSOMUS AURATUS, *Bloch and Schneider.*

Noticed by Castelnau under the synonym *Pagrus unicolor.*

PLATYCEPHALUS LÆVIGATUS, *Curvier and Valenciennes.*

In addition to the foregoing and the introduced:—

CARASSIUS AURATUS, *Linnæus*, and

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* Castelnau—Proc. Zool. Soc. Vict., 1873, ii., pp. 123 - 149.
† Ogilby—Edible Fishes N.S.W., 1893, p. 114.

we have received the following species :—

GONORHYNCHUS GREYI, *Richardson.*

TYLOSURUS FEROX, *Günther.*

I am not aware that this species has been previously recorded from West Australia. Castelnau has described a species under the name *Belone gavialoides*,* which, judging from the description, and taking into account the relative position of the fins, is distinct from *T. ferox.*

TRACHURUS DECLIVIS, *Jenyns.*

COLPOGNATHUS DENTEX, *Cuvier and Valenciennes.*

Günther's type of *C. richardsonii*,† regarded by Boulenger‡ as synonymous with *C. dentex*, was obtained at Freemantle, at the mouth of the Swan River, wherein Mr. Woodward's specimens were taken. Our examples are without markings of any description, and this fact, taken in conjunction with the widely different colouration or ornamentation of the figures of Quoy and Gaimard,§ Richardson,‖ and Günther,¶ indicates that the species is subject to great variation in colour and pattern.

CHRYSOPHRYS DATNIA, *Forsk.*

Although this species does not appear to have been previously noticed from Western Australia, it was naturally expected that, having such an extensive distribution, it would sooner or later be thence recorded. It may now be said to occur on the whole of the eastern, northern, and western seaboards, but being so much more numerous in the tropics, we are scarcely likely to find more than a straggler or so on our southern shores.

ODAX RICHARDSONII, *Günther.*

The specimens received do not differ from examples taken in Port Jackson; the dark markings on the body are very pronounced, and in this the examples are not unlike *O. semifasciatus*, Cuv. and Val., from which the species is distinguished by the serrated preoperculum and by the smaller number of scales above the lateral line—seven in *O. richardsonii*, fifteen in *O. semifasciatus.*

The serrations in some specimens are so slight as to be of doubtful specific value, yet Castelnau proposed for examples with serrated preoperculum, the generic name *Neodax.*

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* Castlenau—Proc. Zool. Soc. Vict., ii., 1873, p. 142.
† Günther—Proc. Zool. Soc., 1861, p. 391.
‡ Boulenger—Brit. Mus. Cat. Fish, (2), i., p. 310.
§ Quoy and Gaimard—Voy. "Astrolabe," Poiss., pl. iv., fig. 2.
‖ Richardson—Zool. Ereb. and Terr., Ichth., pl. lvii., figs. 3–5.
¶ Günther—*Loc. cit.*, pl. xxxviii.

PERIOPTHALMUS KOELREUTERI, *Pallas.*

The occurrence of this species in such a comparatively high latitude as Perth, is another instance of the more tropical character of the west than the east coast of Australia. On the east, Castelnau records it* from the entrance of the Brisbane River, south of which it has not been observed. *P. australis*, Cast., is said to be found on the mud flats of the Richmond River, New South Wales.† Saville Kent, in his paper on the Marine Fauna of Houtman's Abrolhos Islands,‡ shows how the Abrolhos support a wealth of tropical life, such as Holothurians and the more brilliantly coloured Labroids, familiar to him from Torres Straits and the more northern regions of the Great Barrier Reef.

Houtman's Abrolhos are of coral growth, a formation met with on the eastern mainland only in much lower latitudes, and in explanation Mr. Saville Kent writes:—"The anomalous character of the marine fauna of Houtman's Abrolhos, as herein defined, can only be accounted for by the assumption that an ocean current, setting in from the equatorial area of the Indian Ocean, penetrates as far south as this island group, and has borne with it the floating embryos of the Holothuridæ and Cœlenterates, etc., that so characteristically distinguish it. A reference to the Admiralty charts, dealing with the ocean currents of this region, supports this interpretation to a considerable extent; indicating as a matter of fact, a prevailing northerly set along the western coast of Australia, but at the same time a distinct southerly intrusion of the waters of the Indian Ocean at some distance off shore, down towards and closely approaching Houtman's Abrolhos."

HOPLEGNATHUS WOODWARDI, *sp. nov.*

(Plate xxxvii.)

B. v. D. xi. 11. A. iii. 2. V. i. 5 P 17. C. 17. L. l. 62. L. tr. 25 - 60.

Length of head 2·57, of caudal fin 5·76, height of body 2·31, in the total length (caudal excluded). Eye very large, 3·63 in the length of the head, 1·25 in the snout, and 1·13 in the interorbital space, which is slightly convex. Nostrils approximate, the anterior round, the posterior elongate, its own length in advance of the margin of the eye. The upper profile of the head with a pronounced swelling above the anterior nostril, and forming a sharp bony keel on the occiput. Dorsal and ventral profile a gentle curve. Upper jaw the longer. Cleft of mouth medium, almost horizontal, the maxilla extending to within the anterior margin

* Castelnau—Proc. Linn. Soc. N.S.W., ii., 1878, p. 231.
† Ten.-Woods—Fish and Fisheries N.S.W., 1882, p. 27.
‡ Saville Kent—Rep. Brit. Assoc., 1895, p. 732.

of the orbit. Opercles entire, with one flat jagged spine. Post-temporal and clavicular plates very pronounced.

Teeth.—These consist of a bony lamella in each jaw, with median division, as in *Tetrodon*; the lamella is translucent, and the summit of each tooth can be traced in its substance, the whole forming a regular diagonal mosaic. As the teeth are successively pushed to the margin of the lamella, their crowns become free and they then form a sub-imbricate series, each crown being grey, tipped with black. These peculiarities are more noticeable in the lower than in the upper jaw. Behind the anterior series is a group of rounded teeth, white in colour; within the upper lateral series are a few isolated teeth, similar in colour and form to those in the lamellæ.

Dorsal spines very strong, compressed, increasing in height to the seventh, which is exactly half the length of the head, and higher than the rays; the last spine nearly equals the fourth in length; the basal length of the spinous is nearly twice that of the soft portion. The anal spines are rather stronger than those of the dorsal, the third somewhat exceeds the second in length, and is 2 6 in the length of the head, and equals the fourth dorsal; the rays are similar to those of the rayed dorsal. The fourth upper ray of the pectoral is the longest, it is rather longer than the ventral, and is contained 1·7 times in the length of the head. The ventral spine is similar to the longest dorsal in character and extent, and the fin all but reaches the vent. The caudal is emarginate, the upper lobe slightly the longer; the least height of the pedicle is one-third the length of the head. The spinous portions of the dorsal and anal fins are received into a deep groove, and the soft portions are scaly at the bases, as is also the caudal.

Scales—small, finely ctenoid or ciliate, those on the opercules freer and of more angular contour than those of the body. Upper part of head, snout, maxilla, mandible, and two or three elongate areas above and behind the eye naked, otherwise scaly.

Colours—Yellowish or brownish, which may in life have been pink. The fins are dusky and without markings, excepting the dorsal and anal, which are blotched, as below described. The markings on the body are five broad black vertical bars. The first passes from the top of the head, through the eye, and down the cheek. The second arises in advance of the dorsal fin, involving the first two spines, thence across the base of the pectoral. The next bar passes from the 7 – 10 dorsal spines to the vent. The fourth connects the dorsal and anal rays, forming a black blotch on each fin, and continued backwards along the base of the anal rays; while the fifth, which is narrower, passes across the base of the caudal pedicel. All the bars are inclined obliquely backwards and are narrower towards the ventral surface.

This species is perhaps the one doubtfully referred by Johnston* to *H. conwayi*, Rich.† It is, however, quite distinct from that species, and differs in the following particulars :—

The dorsal has a smaller number of spines, and is relatively very much higher, the spines also are longer than the rays; whereas in *H. conwayi* the rays are twice as long as the spines—a character common also to the anal.

H. fasciatus and *H. punctatus*‡ have each twelve dorsal spines and sixteen rays, the body in these species is shorter and higher, the eye is smaller and the soft vertical fins much longer than in *H. woodwardi*.

In common with other Australian workers, I have at times referred to the difficulty experienced by zoological writers living at prohibitive distances from European literary centres, and the hopelessness, in many cases, of bringing an undertaking to a satisfactory conclusion. Such disabilities are caused by a lack of necessary literature, and many are the instances in which a train of research has to be abandoned owing to the impossibility of consulting some particular paper.

Where a genus is weighted with a large number of species, the difficulty may be appreciated; but when only a few are known, the task would seem to be a simple one; this may not, however, be so, and I may instance *Hoplegnathus*, the genus now under consideration.

Richardson first described the genus in 1840, as a Scaroid, under the name *Oplegnathus*,§ the species being *O. conwaii*. The following year he altered the generic name to *Hoplegnathus* and the specific one to *conwayi*, when exhibiting drawings before the meeting of the British Association,‖ and in 1849 published a full description and figure.¶ The specimen described was supposed to be from Australia. In the year 1844, Temminck and Schlegel described two fishes from Japan under the generic name *Scarodon*, namely, *S. fasciatus* and *S. punctatus*,‡ and mention the earliest representation of a species in the Atlas of Krusenstern's voyage, under the name "Poisson perroquet noir."** Both these examples were from Japan.

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* Johnston—Proc. Roy. Soc. Tas., 1884, p. 194.

† Richardson—Proc. Zool. Soc., 1840, p. 27; and Trans. Zool. Soc., 1849, iii., p. 144, pl. vii., fig. 1.

‡ Temminck and Schlegel—Fauna Japon, Pisces, 1844, p. 89, pl. xlvi. and p. 91.

§ Richardson—Proc. Zool. Soc., 1840, p. 27.

‖ Richardson—Rep. Brit. Assoc., 1841 (1842), pt. 2, p. 71.

¶ Richardson—Trans. Zool. Soc., iii., 1849, p. 144, pl. vii., fig. 1.

** Krusenstern—Atlas, pl. lii., fig. 2.

We next turn up Richardson's paper on the Ichthyology of the seas of China and Japan,* and find that he recognised the generic identity of *Scarodon* with his own *Hoplegnathus*, and under *H. punctatus* mentions having seen, very cursorily, in the Museum at Fort Pitt, a spotted *Hoplegnathus* from Norfolk Island. As the only island of that name, according to the atlas and the gazetteer, is the dependency of New South Wales, it would seem as though this species should be credited to our fauna, but Richardson describes its habitat merely as the seas of Japan and China. In the work quoted, he, with doubtful judgment, coins a third name—*H. maculosus*, his type being a drawing only, at the same time he doubts its specific distinction from *H. punctatus*.

In 1854, Bleeker raised the genus to family rank under the name *Hoplegnathoidei*,† but I have not access to his paper; he again mentions it in his Archipelago Indico.‡ Two years later, Richardson, who had apparently not seen Bleeker's work, placed his *Hoplegnathus* as a genus under *Chætodontidæ*.§ The three valid species mentioned, are recorded by Günther‖ in 1861, but it becomes evident that one paper on the subject had at that time been overlooked, of which more later.

On referring to the Zoological Record for 1865, we read¶:—"*Hoplognathus*. M. Guichenot states that *Ichthyorhamphus* (Casteln.) from the Cape of Good Hope is identical with this genus. Mém. Soc. Sc. Nat. Cherbourg, xi., p. 5. The same author refers it to the Scaroid fishes; but its pharangeal bones are entirely separate, rather feeble, and armed with villiform teeth." The work in which Guichenot published the observation is not accessible to me, and I am unable to find where Castelnau's genus was described. It is omitted from the "Nomenclator Zoologicus" of Scudder, and on searching the Royal Society's Catalogue such references as I can consult do not contain notice of the genus *Ichthyorhamphus*, so that I am unable to learn even the specific name applied by Castelnau.

The following reference is supplied by the Zoological Record for 1867:—**"*Hoplognathus fasciatus* (Kröy.) is described as *Scarostoma insigne* (g. et sp. n.) by Prof. Kner, Sitzgsber. Ak. Wiss. Wien, 1867, lvi., p. 715, fig. 3," and the same subject is recorded in the Zoological Record for 1868, as follows††:—"Prof. Kner also has recognised the identity of his *Scarostoma* with this genus (See

* Richardson—Rep, Brit. Assoc., 1845, p. 247.
† Bleeker—Ver. Akad. Wetensch. Amsterdam, i., 1854, Japan, p. 6.
‡ Bleeker—Spec. Pisc. Arch. Indico, 1859, p. 250.
§ Richardson—Encyc. Brit. (Ed. ix.), Ichth. xii., p. 303.
‖ Günther—Brit. Mus. Cat. Fish., iii., 1861, pp. 357–8.
¶ Günther—Zool. Record, 1865, Pisces, p. 184.
** Günther—Zool. Record, 1867, Pisces, p. 161.
†† Günther—Zool. Record, 1868, Pisces, p. 146.

Zool. Record, iv., p. 161); but he still thinks that the fish described by him is a new species (Wiegm. Arch. 1868 in Troschel's Bericht). [It is *Hoplognathus fasciatus* of Kröyer, not of Schlegel; the name of the Japanese species may be changed to *Hoplognathus krusensternii*.]" We do not possess the Vienna publication, so that further research in this direction is impossible. There is no reference to where Kröyer's paper was published, but such is ultimately traced by Carus and Engelmann's Bibliotheca Zoologica (1861, p. 1028); the reference being:—"*Oplegnathus fasciatus*. in: Kröyer, naturhist. Tidsskr. N. R. Bd. i., 1845, p. 213 – 223," a work to which again I cannot refer. In passing it may be noted that the Bibliotheca does not record Castelnau's *Ichthyorhamphus*.

I have no direct evidence as to where Kröyer's type was obtained, but Günther writes of the family *Hoplognathidæ**:— "One genus only is known, *Hoplognathus*, with four species from Australian, Japanese, and Peruvian coasts": as we know the species representing the two former habitats, I presume Kröyer's example was from Peru, and it is possible that *H. woodwardi* is identical with *H. fasciatus* from Peru, many types being common to Australia and South America. It is to be noticed that the Cape of Good Hope, supposed to be represented by *Ichthyorhamphus*, is not included in the distribution of the family.

Although the Fauna Japonica, Pisces, bears on the title page the date 1850, the work was issued in parts, commencing 1844, in which year the decade containing *Hoplegnathus* appeared. It thus antedated Kröyer's paper, published in 1845, which was however not recorded by Günther in his Catalogue, and this constitutes the omission previously referred to. The changing of the name of the Japanese species was therefore not justified, as acknowledged later by using *H. fasciatus*, according to priority.† Steindachner has redescribed the species, but unfortunately I am unable to consult his paper.‡

In changing the spelling of *HoplEgnathus* to *Hoplognathus*, Günther had apparently assumed that the derivation of the prefix was ὅπλον = ARMA, whereas Richardson expressly states that his derivation was ὁπλὴ = UNGULA.§

Further, the name *Hoplognathus* is inadmissible for this genus, having been used in 1819 by MacLeay, and again by Chadoir in 1835, for different genera of Coleoptera. It was subsequently (1844) used by Burmeister, also in Coleoptera.

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* Günther—Study of Fishes, 1880, p. 410.
† Günther—Challenger Reports, Zool., i., Shore Fishes, 1880, p. 64.
‡ Steindachner—Sitz. K. Akad. Wiss. Wien., cii., 1893, p. 222.
§ Richardson—Trans. Zool. Soc., 1849, iii., p. 144.